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Subject: Re: the or no the
To: katieh@zilker.net (Katie Hafner)
Date: Tue, 23 Jan 1996 13:05:30 -0600 (EST)
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Katie -

Thanks for the chance to comment. Especially as it's easy to overstate the importance of the ARPANET at the time. And I think maybe you have. Remember, it was just ONE of a bunch of similar ideas going on at the time - X.25 by Merit and the telcos, DECNET - heavily favored by the independent high-energy physics crowd, and MFENet home-grown hardware, software and protocols by Department of Energy. They are where most of the horsepower was, and they ROUNDLY and LOUDLY denounced TCP/IP as amateurish, insecure, and a myriad of other even more ugly epithets.

So in fact CSNET was not formed because computer scientists wanted access to ARPANET. The reason was in fact much more lofty and defensible: those were early days for the discipline of computer science; it was not even ****recognized**** as a discipline by the "pure" sciences ("Any discipline that needs 'science' in its name isn't" was one of the gentler gibes). To be sure, quality varied widely among academic CS departments, with (arguably) the ARPA-funded ones at the top of the heap (many of those were funded by ONR's Marvin Denicoff, an early CS crusader in Gummint, with ARPA money), and it was NSF's idea (well, Larry Landweber's, Dave Farber's, and Rick Adrion's) that if the departments were ****networked**** together, they could share teaching mtl's, cry on each others shoulders, pull each other up by the bootstraps, and so on. That was the ****reason**** for CSNET - to improve the breed of academic computer science departments.

Wowk
This
is to
CSNET

It was Dave Farber, I believe, who conceived of the notion of using the existing ARPANET to carry the long-haul traffic for CSNET, and it was certainly he who at his political best convinced ARPA's Bob Kahn (another public-spirited and decidedly NOT apolitical gentleman) to allow CSNET traffic on ARPA circuits. Difficult to overstate the importance of this step! The FIRST case of using stat multiplexing to serve different masters. Worth a paper in itself.

Matters in the NSFNET case were very similar. The Lax Report (1978? Peter Lax NYU/Courant) commissioned by the NSF commented on the absurdity of US scientists traveling abroad to compute on US supercomputers, since all the supercomputers in the US were behind barbed wire doing classified stuff, or were too expensive for mere mortals to compute on. It went on to recommend that the NSF establish a program under which US scientists could use US supercomputers in the US.

Initially this would be by buying time at existing supercomputer centers such as those of AT&T and Boeing, but that was to be only while some NEW centers would be built (competitively) with the NSF dollar, and which the US scientific community could use essentially free. And oh yes by the way the Lax report said the new centers should be networked together... NO MENTION OF THE ARPANET.

At the outset of the NSFNET program (before my time), it was recognized that it would take time to design and build such a network, so using the Dave Farber / CSNET example, Erich Bloch (Director of NSF) went to Bob Kahn at ARPA and struck a deal: NSF would give ARPA

(which had become DARPA by then) \$4m, in return for which DARPA would ****augment**** the ARPANET with 40 new sites of NSF's choosing, to allow NSF-sponsored scientists to gain access to NSF supercomputers ****over** the ARPANET******. Shared use :: second exAmple.

Unhappily, it didn't work - since DARPA no longer actually controlled the construction (i.e., facilities acquisition/lease) of the ARPANET; that had been turned over to the Defense Communications Agency which at the time was suffering from terminal bureaucratic viscosity, with the result that the first (56 kb/s) NSFNET was built before very many of the new ARPANET sites actually came on line, and indeed the last of the 40 were installed and deinstalled within the same week on the retirement of the ARPANET in June 1990.

In the end, X.25 died because it lacked end-to-end error control (it only did link-by-link); MFENet died because (i.a) it had an address space that limited it to 127 computers worldwide(!); and DECNET died because it opted for the ISO/OSI protocols which never achieved critical mass and were in the end overwhelmed by TCP/IP coming free with every Sun workstation and every copy of Berkeley UNIX.

Hope that helps. Cheers, -s

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